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ABSTRACT

The literature and prior research findings support the belief that motivation-related strategies must be developed to support at-risk learners in postsecondary vocational programs. Essentially, two fundamental approaches have been used to conceptualize motivation. Mechanistic approaches ignore the thinking processes of humans and stress the presence of drives that influence motivation. Cognitive, organismic approaches focus on thinking and information processing. Theory development began with the more mechanistic view and has moved progressively toward adopting a combination of these perspectives, insisting that motivation should involve basic drives or needs as well as the influences of thought processes. The Comprehensive Motivation Model (CMM) that emerged from an analysis and synthesis of the literature depicts the interactions and impact of a wide array of factors that influence postsecondary vocational students' educational outcomes. The major components of CMM are volition processing, ecological influences, cognition influences, influences related to beliefs, and influence of the emotional state. A crucial aspect of CMM is the differentiation of its intrinsic and extrinsic motives. Each component of the motivation schema could potentially be assessed. Recommendations to researchers are to expand and refine CMM's concepts, develop risk-reducing strategies related to the model's concepts, and validate those strategies' effectiveness and efficiency. (99 references) (YLB)

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FORMULATING A CONCEPTUAL MODEL OF MOTIVATION: IMPLICATIONS FOR ENHANCING ACCOMMODATION OF AT-RISK LEARNERS IN POSTSECONDARY VOCATIONAL EDUCATION PROGRAMS

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BACKGROUND

Excessive student attrition rates represent a serious problem in postsecondary vocational education programs. Students who perform below their ability levels, who are unwilling or unable to invest sufficient effort to fulfill program requirements, or who display inappropriate behaviors are likely to drop out before attaining educational and career outcomes commensurate with their ability levels. These at-risk learners frequently become discouraged when they encounter educational environments that they perceive as noncaring, as unwilling to respond to or understand their unique attributes, and/or as being unable to accommodate their special learning needs. Such students often experience increased and ongoing feelings of stress. Because of this, increasing alienation emerges as a consequence of their inabilities to effectively manage the stresses associated with their educational programs. Such circumstances diminish their abilities to attain their educational goals, thereby increasing their tendencies to drop out.

The dilemmas presented by at-risk learners represent a multitude of challenges to the efficacy of postsecondary vocational education programs. These issues reflect the natural diversity of students' lives and the unique educational challenges they present to vocational educators. With a diverse array of students enrolling in postsecondary vocational education programs, personnel in those programs are faced with how to provide quality educational experiences while also seeking to enhance those students' chances of attaining their vocational training goals. There has been an increase in public criticism about the effectiveness of job placement services for students and the problem that too many students are not successfully completing their programs. Because of these concerns, many institutions are seeking to develop more effective strategies for improving the retention of students who display a variety of special learning needs. A key component of these efforts focuses on the accommodation of special needs learners. Efforts to implement new adaptive instructional technologies, as well as strategies focused on the attitude-related traits of students, are considered crucial to at-risk student retention efforts.

As educators have become increasingly aware of factors external to instructional settings that may interfere with student learning (i.e., chemical abuse, child abuse, teen pregnancies, delinquency, and status offenses, as well as specific developmental learning problems, physical disabilities, racial discrimination, and economic difficulties), they have also recognized that many students are unable to resolve chronic problems often associated

with these factors. It is not uncommon for at-risk students to have multiple concurrent and/or consecutive environmental factors negatively affecting their lives. Problems caused by these factors are often exaggerated by the lack of effective strategies available to students for resolving or coping with such stressors in their lives. Thus, additional research should be focused on responses of students to the stress caused by these external factors and the competencies needed by students to manage stress effectively. Equally essential to investigations of the effects of antecedent events and the abilities of students to cope with life's stressors, however, is a need to investigate the influence of student motivation, social competencies, and coping abilities which influence their educational attainments. Students who tend to have difficulty successfully confronting and adapting to life-stressing events are believed to represent a substantial proportion of our society's at-risk learners.

Brown and Kayser (1982) examined student satisfaction with vocational training programs and teacher perceptions of the satisfactoriness of student performance. The purpose of their investigation was to validate the ability of these factors to identify at-risk students. After successfully verifying these factors, Brown and Kayser developed the Theory of Educational Adjustment (TEA). Generally, they found that satisfaction and satisfactoriness ratings were an accurate reflection of the educational adjustment levels of students within postsecondary vocational programs and could, thus, be used to identify and accommodate at-risk learners in order to maximize retention.

In 1988, Brown described a number of broad factors that had been identified by the Student Satisfaction and Student Satisfactoriness Instruments (see Figure 1 for the results of a factor analysis of the "Student Satisfaction Instrument," and Figure 2 for the results of a factor analysis of the "Satisfactoriness Instrument"). Student motivation emerged as a key factor associated with student retention in vocational training programs. From the perspectives of postsecondary vocational instructors, motivation was also perceived to be an important factor influencing student retention in their training programs. Thus, Brown concluded that strategies for assessing student motivation traits would be useful components for accommodating and retaining at-risk learners. This project was implemented as the first step toward addressing the recommendation inherent in Brown's conclusion.

Figure 1
Amount of Variance Accounted for by Satisfaction Ratings

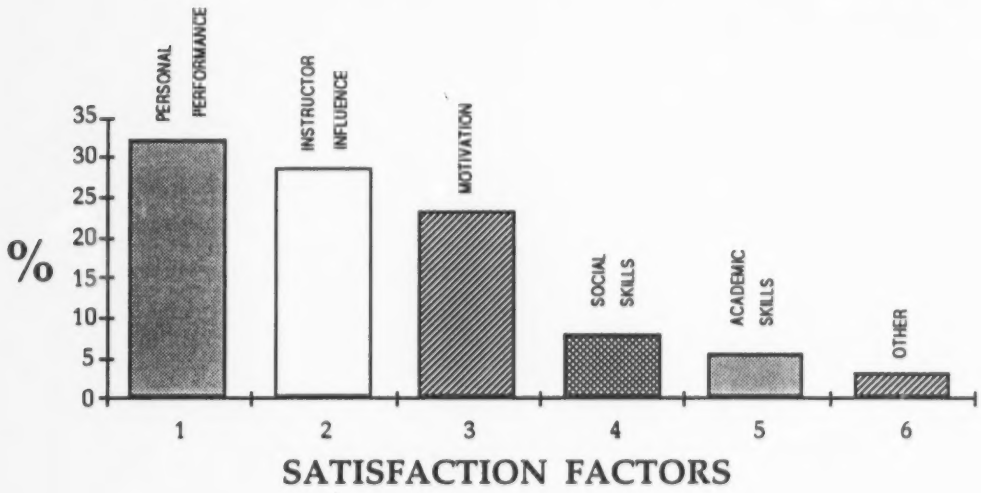


Figure 2
Amount of Variance Accounted for by
Standardized Satisfactoriness Ratings

Keller, Kelly, and Dodge (1978) assured educators that academically related motivation levels can be increased. They proposed that students should be assessed to determine (1) their likelihood of working hard in school, (2) what counseling resources they may need, and (3) what educational environments and methods can best accommodate their motivation traits. Such assessment strategies could enable educators to identify at-risk learners before or during the early stages of their experiences in training programs, thus providing support service personnel with opportunities to target at-risk students who are likely, otherwise, to become underachievers or dropouts.

Since motivation-related factors play key roles in the achievements of at-risk students, it seems feasible and desirable that subsequent research efforts be focused on developing strategies to identify and accommodate at-risk students' motivational and educational deficits *before they enroll* in postsecondary vocational education programs, as well as periodically *during their enrollment*. Hopefully, it eventually will be possible to provide motivation-related accommodation strategies that will enable vocational educators to identify symptoms or manifestations of at-risk attributes and to develop strategies for helping these students attain their educational goals despite motivation-related problems.

PURPOSE

The purpose of this research project was to review the literature and then present a descriptive conceptual model for addressing motivation-related factors and issues which impact at-risk learners in postsecondary vocational education programs. This model will then be tested in a second phase of the project. If this newly developed model is successfully validated in the future, the model could become an effective mechanism for suggesting and/or guiding innovative efforts to develop more effective motivation-related tools and strategies. These new tools and strategies could be used to increase the success of at-risk students in postsecondary vocational training programs. Once these successes begin to occur, the long-term goal of retaining such students will be more achievable.

Definitions

At-Risk Learners

Within the context of this publication, students are considered at-risk learners when they perform substantially below their ability levels and/or are in danger of dropping out of school (or at least out of one or more courses). Minnesota State Vocational Education's (1985) program regulations suggested that at-risk learners are persons who have traits that impact their academic achievement, social and emotional development, and/or career development. Persons with these traits tend to be categorized as special needs learners, persons with disabilities, and handicapped persons. However, they may also have other attributes such as chemical abuse or low or inappropriate motivation.

The terms "at-risk" and "special needs learners" will be used interchangeably throughout this publication to refer to all persons who have or are likely to encounter educational performance difficulties which (1) can be attributed to numerous factors occurring both within and outside classroom settings, (2) can influence their motivation, and (3) can affect their efforts to attain their vocational education program goals. In other words, these students are less likely to attain their personal educational goals than typical students and/or are more likely to drop out of school.

Motivation

Motivation causes individuals to pursue, act on, or be driven by goals. There are many useful ways to codify motivation concepts. This study has classified motivation into two categories: (1) internal or *intrinsic* and (2) external or *extrinsic*. Intrinsic motivation is related to incentives that originate from within individuals such as a desire to be a musician, to live in a rural setting, or to find love or happiness. Thus, intrinsic motivation is not a function of external pressures or rewards (deCharms, 1968). Extrinsic motivation originates as a result of external influences such as the benefits of accumulating large sums of money, high academic performance records, or power and influence. Harter (1978) delineated five dimensions of classroom learning that she believed adequately characterized the differences in orientation between intrinsic and extrinsic motivation:

1. Learning motivated by curiosity versus learning in order to please teachers,

2. The incentive to work for one's own satisfaction versus working to please teachers and get good grades,

3. The preference for challenging work versus easy work,

4. The desire to work independently versus dependence on teachers for help, and

5. Internal criteria for success or failure versus external criteria (e.g., grades and teacher feedback) to determine success or failure.

REVIEW OF MOTIVATION CONCEPTS

Since the late 1800s, studies of organisms and motivational concepts have enabled researchers to examine motivation from a variety of perspectives. The research has been so extensive that the following review is not exhaustive; instead, the following discussion attempts to present some of the more salient theoretical constructs. Historically, motivation research has been clouded by ambiguity and grandiose claims of potential benefits. Just as the human organism is complex so is the concept of motivation.

Researchers attempting to synthesize the history of motivational theories face a difficult job; many theories interact while other theories address only isolated facets of the concept. Essentially, two fundamental approaches can be used to conceptualize motivation: (1) mechanistic approaches which ignore the thinking processes of humans and stress the presence of drives which influence motivation; and (2) cognitive, organismic approaches which focus on thinking and information processing. Theory development began with the more mechanistic view and has moved progressively toward adopting a combination of these perspectives, insisting that motivation should involve basic drives or needs, as well as the influences of thought processes.

Mechanistic Approaches

For several decades, behavioral and psychoanalytic psychologists dominated the field of psychology. Behavioral psychology had its roots in laboratory experiments with animals, while psychoanalytic psychology had its roots in subjective analysis and introspection based on individuals' clinical interactions with other people. Both perspectives postulate that behavior can be reduced to a small number of physiological drives. While behavioral psychology focuses on associative bonds created between stimuli

and responses, psychoanalytic psychology focuses on unconscious urges. Both movements, however, postulate that pleasure is derived from a reduction of drives which reduces tension.

The empiricism movement was initiated by Hull (1943). He was one of the first theorists to identify the importance of incentive motivation in the achievement of goals. Hull's theory included four drives to energize behavior: (1) hunger, (2) thirst, (3) sex, and (4) avoidance of pain.

It became obvious, however, that drive theories were inadequate for describing complex behaviors. Consequently, over the years, researchers proposed other drives and a variety of explanations that would fit into the psychoanalytic and drive conceptions. Hartmann (1939) described ego as an intrinsic motivator having a role in adaptations. Hendrick (1942) included "instinct to master" in the list of drives, while Fenichel (1945) considered "avoidance of pain" and "exploration" as drives to reduce anxiety.

Deci and Ryan (1985) suggested the inclusion of curiosity, exploration, and manipulative behaviors. Other drives hypothesized include (1) the exploratory drive (Montgomery, 1954, 1955), (2) the drive for visual exploration of environment (Butler, 1953, 1957, 1958; Butler & Harlow, 1957), (3) the manipulation drive (Harlow, 1953), (4) the relief of an unchanged stimuli boredom drive (Zimbardo & Miller, 1958), (5) the sensory or boredom drive when there is insufficient stimulation (Isaac, 1962); and (6) the need for stimulation drive (Davis, Settlage, & Harlow, 1950; Harlow, 1950, 1953; Harlow, Harlow, & Meyer, 1950).

Over the past four decades, at least eighteen different drive theories were reported in the literature. Alone, these drive theories seem incapable of offering satisfactory explanations of emotions and do not address the conscious processes in motivation. The suggestion of ego energy (i.e., a drive referring to self-regulation of organisms) (Hartmann, 1939; Nunberg, 1931; White, 1963) represented the beginning of a more cognitively oriented movement in psychoanalytic theory—a beginning that evolved to include volition and self-direction. Because of this, increasing attention has been focused on volitional activities such as self-direction, conscious imagining of future outcomes, and the achievement of goals.

Cognitive Approaches

White (1959, 1960, 1963) also postulated that when subjects feel in control and can manipulate their environments, they experience feelings of competence and task persistence. Competence is considered to be an innate and intrinsic energy source for individuals, which means that external reinforcement is not necessary to maintain behavior.

Lewin's field theory (1935, 1936, 1948, 1951) suggested that pleasure is derived by a reduction of both drives and tension, and that it also is influenced by an individual's perception of the world. Lewin's theory is known as a cognitive expectancy-value framework. The theory includes an investigation of past history, as well as consideration of whole situations and all the forces within an environment. Lewin believed that behavior is determined by forces involved in situations at the moment. Unobservable variables of choice and decision making were believed to be based on previous experiences, thus, replacing stimulus-response associations. Researchers then began to look at behavior in terms of the influences exerted by expectations (Vroom, 1964) or reinforcements likely to occur in the future (Bandura, 1977).

Several theories sprang from this cognitive trend in psychology. Murray (1938, 1959) speculated that people have many needs and proceeded to develop a taxonomy of twenty different needs, one of which is the need to achieve. McClelland, Atkinson, Clark, and Lowell (1953) found that people are attracted to stimuli that provide optimal levels of incongruity. His affective arousal theory described people as approaching mildly discrepant conditions, while avoiding highly discrepant ones. McClelland (1958, 1961) included a role for expectancy: The probability of subjects approaching new situations depends on the perceived likelihood of pleasure that will be received from the experiences. Motivation tends to depend on past associations, the resulting expectancy of pleasure, and the quality and quantity of behaviors required in situations.

Atkinson (1957, 1964) is considered the founder of achievement theory which describes the conflict between hope for success and fear of failure. For example, success may bring pride in achievement, and the consequences of failure to achieve may bring shame.

Personal causation is a concept developed by deCharms (1968). All individuals tend to desire to control their own fates, which is intrinsically motivating. In order for intrinsic motivation to occur, it is important for individuals to initiate their own actions and become self-determining. Thus, true intrinsic motivation develops when individuals feel free of pressures, rewards, and contingencies to perform behaviors.

Deci and Ryan's (1985) theory of intrinsic motivation assumes that individuals have innate needs for competence and self-determination, both of which energize behaviors. To become intrinsically motivated, individuals should perceive an internal locus of causality, realize they have choices, recognize that they can have control over outcomes, and maintain an active part in decision-making efforts. Thus, individuals can choose either to take control or to give up control.

Deci and Ryan (1985) assumed that people are active organisms working to master both internal and external environments. Therefore, they proposed that motivation theories and concepts should be built upon volition, intentionality, and will. They further concluded that individuals are intrinsically motivated when they participate in activities without rewards, contingencies, or control.

The cognitive perspective of motivation focuses on thoughts, encoded information, and beliefs as determinants of actions, perceptions, emotions, and ego-defense behaviors. These thoughts and beliefs can be grouped into seven major categories: (1) attribution of success and failure; (2) information- and help-seeking; (3) metacognition, problem solving, and cognition strategies; (4) emotional states; (5) self-evaluations; (6) instructional decisions; and (7) expectancies for future success. All of these act to influence the rules and standards by which individuals manipulate their environments.

Influences of Developmental Experiences and Individual Traits

Problem solving and decision making by individuals, as well as the nature of their responses to specific situations, are influenced by their previous developmental experiences and individualized motivational characteristics. Individual differences among people tend to expose them to differing opportunities to learn new things, which further exaggerate their dissimilarities and increase the importance of each person's intrinsic motivation traits

(Arbitman-Smith, Haywood, & Bransford, 1984). Arbitman-Smith, Haywood, and Bransford cited Haywood (1968) and Haywood and Burke (1977) who contended that persons with strong intrinsic motivation levels tend to view satisfaction primarily as a function of task factors such as learning, responsibility, challenge, risk, the processing of relatively novel and/or complex information, and the purely aesthetic satisfactions related to task achievements. Furthermore, such persons tend to learn more efficiently than do those who have relatively low intrinsic motivation traits. As might be expected, intrinsic motivation and cognitive effectiveness are mutually enhancing dimensions having separate effects. Comprehensive analyses of the interactions between information-processing activities and motivation factors could enhance our understanding of how individual choices operate in the real world, and also could identify some of the environmental conditions that enhance or inhibit decision making.

Motivation's Influences on Cognitive Performance

Ziegler (1969, 1971) and Ziegler, Hodgden, and Stevenson (1958) proposed that inadequate performance of cognitive tasks cannot be well understood in the absence of an understanding of the motivational processes which influence cognitive performances. Borkowski, Reid, and Kurtz (1984) believed that production deficiencies, common among persons with mental retardation, can be interpreted in terms of metacognitive failures. Stated in less complex terms, cognitively handicapped learners may have strategies in their cognitive repertoires that are applicable to the tasks-at-hand, but they simply may not know when, how, where, and why each of these strategies should be applied.

Mentally retarded persons tend to be extrinsically motivated in the sense of seeking satisfaction in ease, comfort, safety, and security (Haywood, 1964). They are outer directed (Turnure & Ziegler, 1964), are governed by their external locus of control (Cromwell, 1963), and are punishment avoiders (McManis & Bell, 1968). Siegel (1979) reported that these studies contain a common theme which suggests that cognitively impaired persons have impoverished coping repertoires, are prone to experience failure, have little trust in their own resources, and, therefore, turn to their external environments for support.

The work of deCharms (1968) suggests that there may be significant interactions between intrinsic/extrinsic motivation and an individual's perceived control of situations. deCharms also noted that an individual's perceived control of situations tends to shift from internal to external when external rewards are given for performing tasks that are already considered to be intrinsically interesting. Seligman's (1975) model of "learned helplessness" indicates that mentally retarded persons are often defeated by histories of chronic failures in attempts to cope effectively. The literature also suggests that the unique learning experiences of special needs learners tend to influence their motivational inclinations.

Turnure, Bium, and Thurlow (1975) proposed that motivational components influence the efficacy of cognitive strategies, self-esteem, internal locus of control, and beliefs about the causes of success and failure. In addition, the development of social competencies in students may be inhibited by the presence of secondary handicapping features such as anger, temper outbursts, avoidant/resistant behaviors, and more severe manifestations of mental illness. These characteristics produce additional barriers to effective intervention and strategy production and may represent dysfunctional and disordered strategy formations which displace the more socially appropriate competencies needed to succeed within postsecondary vocational education programs.

COMPREHENSIVE MOTIVATION MODEL (CMM)

The foregoing literature clearly suggests that educators need to understand motivation factors in order to identify and analyze the educational needs of at-risk learners in postsecondary vocational education programs. However, the ability of vocational programs to retain at-risk students may be closely linked to the willingness and ability of instructors to adopt strategies that lessen the impact of their students' motivation-related learning problems.

The preceding literature review identified a wide variety of concepts and ideas that are related to the goals of this publication (i.e., a descriptive conceptual model of motivation concepts and its implications for at-risk students in vocational education [see Figure 4]). However, the following sources were especially influential in the development

of a model intended to support efforts to enhance educators' understanding of motivation's potential role(s) in the retention of at-risk learners:

1. White (1959, 1960, 1963) reported that a sense of competence and persistence is enhanced when individuals have a sense of control over their environments.

2. Deci and Ryan (1985) concluded that individuals are inherently energized by their needs to be competent and self-determined within their environments.

3. Arbitman-Smith et al. (1984) suggested that exposure to different environments tends to exaggerate natural characteristics, thus increasing the importance of motivation traits.

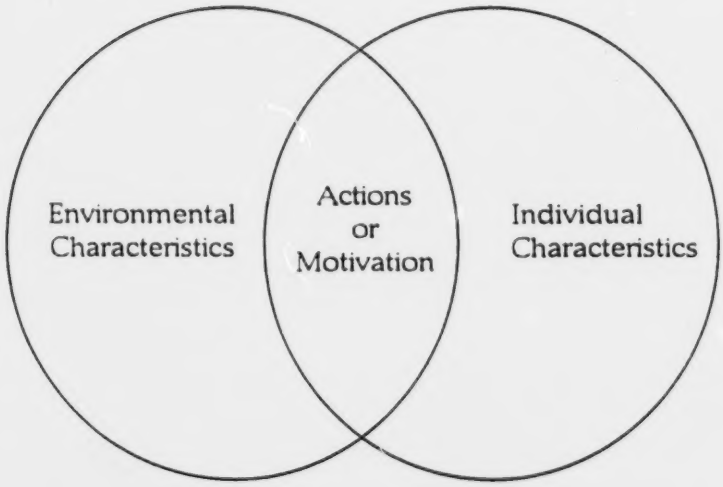
4. Ziegler (1969, 1971) and Ziegler et al. (1958) theorized that the ability of individuals to perform cognitive tasks should be examined in combination with motivational processes.

5. Siegel (1979) supported the Ziegler and Ziegler et al. perspectives by suggesting that the accomplishments of persons with disabilities are especially susceptible to positive and negative influences within their environments.

6. Turnure et al. (1975) and deCharms (1968) concluded that inherent motivational traits are influenced by environmental influences such as cognitive strategies, self-esteem levels, perceived locus of control, and beliefs about the probability of success or failure.

From a broad perspective, two comprehensive effects appear to have a substantial influence on motivation attributes: (1) the nature of *individuals* and (2) the intrinsic and extrinsic influences within the *environments* of students (see Figure 3). It is assumed, therefore, that motivation tends to be a function of the interactions between persons and their environments. This assumption emphasizes the importance of individuals' perceptions of their experiences, the impact of those experiences on motivation, and the influence of motivation on cognitive and problem-solving abilities.

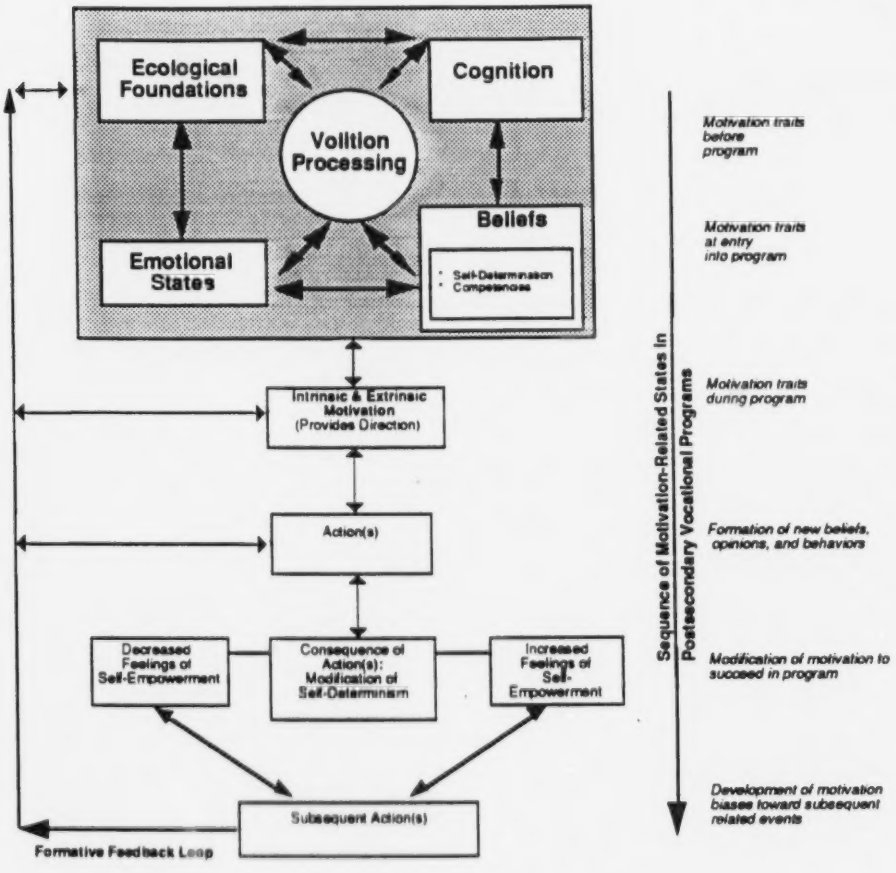
Figure 3
Interaction of Basic Factors that Influence Motivation-Related Behaviors



Indeed, the Comprehensive Motivation Model (CMM), which emerged from an analysis and synthesis of the preceding literature, depicts the interactions and impact of a wide array of factors which, when assimilated, influence postsecondary vocational students' educational outcomes (see Figure 4). CMM synthesizes intrinsic and extrinsic motivation concepts into one conceptual model which could be used to guide subsequent development of motivation-related assessment and intervention strategies for at-risk students.

Motivation is heavily influenced by the experiences unique to each individual. These interactions between individuals and their environments cause individuals to select responses from a wide array of potential behaviors. Behaviors tend to be the result of the combined influences of each individual's genetic or congenital predispositions, prior experiences, cognitive and emotional states, goals, volition, and problem-solving skills and abilities. Thus, the model's operational framework describes highly interactive components which do *not* operate in isolation from one another.

Figure 4
Conceptual Schema for the Comprehensive Motivation Model



Note: Volition consists of the interaction of ecological factors, emotional states, beliefs regarding self-determinism and self-competencies, and cognition. The labels along the right side of Figure 4 describe states which reflect the evolution of the interactions between motivation and performance within educational programs.

Figure 4 depicts CMM's major components and a typical sequence of motivation-related states in terms of an individual's behavior within his or her educational environment. This conceptual model's volition component postulates that volitional influences produce motivational states that influence the nature and direction of intentions and that these intentions have an effect upon subsequent actions. The processing of experiential information is the foundation for subsequent self-determined actions from which consequences such as competencies and skills emerge when an individual seeks to adapt successfully to new and unique situations. Consequences of actions result in learning, achievement, success, feelings about the act or oneself, reinforcement, and re-evaluation of the actions. Through these consequences, self-determinism is modified. The subsequent feedback loop causes self-empowerment to be either diminished or strengthened as a result.

The processes contained in each component can interact with all other components of the model. There is no definite lock-step linear sequence for the development of motivation. Instead, motivation is uniquely associated with the character traits of individuals and with the nature of key environmental factors present in their lives. For example, ecological foundations, emotions, cognition, and formation of beliefs interact as parts of volition, thus serving as the impetus for motivation, and, consequently, providing individuals with direction for their intentions. Research by Atkinson (1964) and Lewin (1936) supports Tolman's (1932) belief that self-determined actions are associated with choice, decision-making, intention, and will. Deci and Ryan (1985) also described individuals as having choices and control over outcomes. Feelings of self-empowerment tend to have their greatest impact by giving individuals a sense of being empowered to affect situations in the future. In other words, their sense of being in control is enhanced.

This information is fed back to earlier components of the model, and motivation continues to evolve as a result of cyclical input from all CMM components. The environmental and individual factors interact with cognition, beliefs of self-determinism and self-competencies, and emotional factors. Subsequently, information about all of these factors is processed to form volition, which then influences the nature of behaviors that are determined by the degree and nature of motivation traits.

The consequences of actions are demonstrated by (1) feelings of success or failure; (2) feelings about decisions or actions; and (3) evaluations of actions, achievements, and/or

their abilities to meet desired achievement levels. The consequences of these actions can enhance or diminish an individual's sense of empowerment, which subsequently determines his or her motivation to continue or to repeat actions.

Studying simple, isolated components of this model does not provide an adequate perspective of motivation-related processes. Knowledge of the factors affecting individual students would be helpful to educators in their efforts to reduce attrition. The development of strategies to assess these traits would also make it easier for educators to identify many previously overlooked at-risk students. Specifically, volition could be assessed through paper-pencil strategies, intention could be assessed by observation of motivation-related behaviors or desires, and self-empowerment could be observed and assessed with paper-pencil strategies. These efforts can also be used to monitor potential dropouts during their training programs in order to provide appropriate support services. Consequently, CMM could function as a guide for activities such as the assessment of volition, intention, and self-empowerment attributes. The following sections of this report describe the major components of CMM in detail and propose assessment strategies.

Volition Processing

Deci and Ryan (1981) defined volition as the ability of individuals to self-initiate behaviors and, thus, provide the impetus to choose actions "to act on the environment and to manage aspects of their drives and emotions." They also contended that "this active organism view treats stimuli not as causes of behavior, but as affordances or opportunities that the organism can utilize in satisfying its needs" (p. 34).

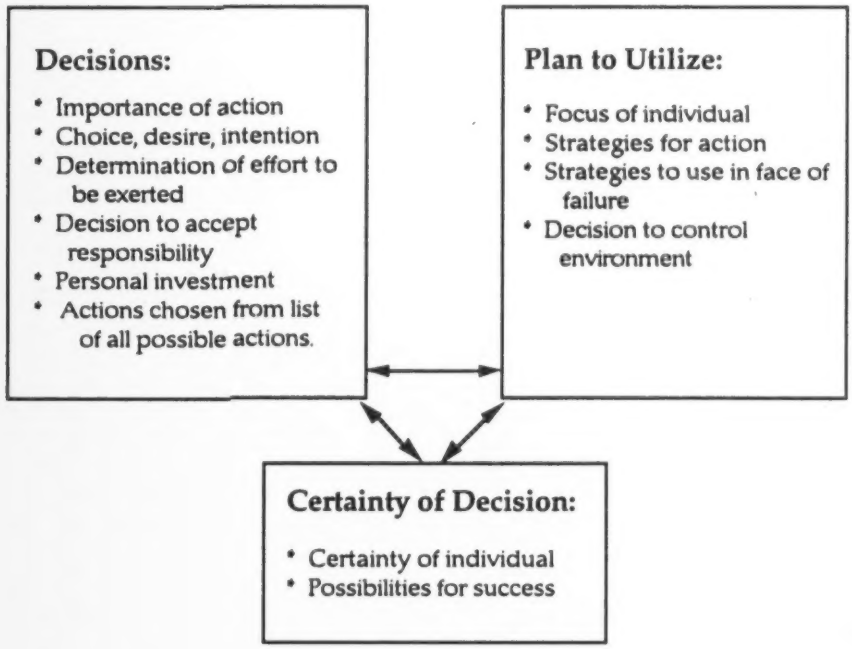
By operating simultaneously, and often in conflict, four major factors interact as "volition" influences motivation in individuals: ecological influences, cognitive influences, beliefs, and emotional states. In CMM, volition also interacts with individuals' perceptions of the value of intrinsic or extrinsic incentives. The consequences of actions or nonaction subsequently provide additional information to these individuals, increasing the knowledge base available for future decisions.

Volitional processing supports the formation of intent and will which determine the actions performed by individuals (see Figure 5). In such situations, a decision has been

made, a plan has been established, the individual has weighed the chances of that action being successfully accomplished, and an action has been performed.

The nature of the effects of motivational drives on performance in a variety of situations often determines feelings of success or failure on tasks. Brehm (1966) described individuals with diminishing motivation as becoming helpless and having impaired effectiveness. Dweck (1986) proposed that motivation affects children's acquisition, transfer, and use of knowledge and skills. Dweck also described motivational patterns that help facilitate or hinder an individual's development of healthy goals and values.

Figure 5
Actions Related to Intentionality and Will


Decisions:
* Importance of action
* Choice, desire, intention
* Determination of effort to be exerted
* Decision to accept responsibility
* Personal investment
* Actions chosen from list of all possible actions.
Plan to Utilize:
* Focus of individual
* Strategies for action
* Strategies to use in face of failure
* Decision to control environment
Certainty of Decision:
* Certainty of individual
* Possibilities for success

CMM acknowledges these dynamics by suggesting that motivation is the driving force in the achievement of goals, influencing the selection of specific goals and, thus, is significantly influential in determining outcomes. It is important to note that students in postsecondary vocational programs (in Minnesota these students have an average age of 27) typically have experienced the formative influence and interaction of these volitional components for several years, making it extremely difficult to isolate their effects.

Ecological Influences

The "volition" component of CMM interacts continuously with the "intention" and "self-empowerment" components. The "ecological foundations" component consists of repertoires of behavior within a variety of environments. The ongoing interactions among environmental factors and individual readiness factors are comprised of subenvironments related to social, home, school, and employment climates. Individual readiness factors include cognitive, psychomotor, emotional, and social traits.

Experiential factors are the results of information gathering; reinforcement; learning activities; past experiences; anxiety; level of participation in experiences; patterns of sensory-motor achievements; and readiness to learn specific knowledge, skills, and values (Cooper & Tom, 1984; Maehr, 1974a, 1974b, 1974c, 1976, 1984; Sewell & Hauser, 1980).

The ecological foundation component consists of the interaction of environmental and individual readiness factors. This component interacts with volitional factors related to emotional states, cognition, and beliefs. These factors are assimilated by individuals through a process known as volition. This processing determines intentions which guide subsequent actions by individuals.

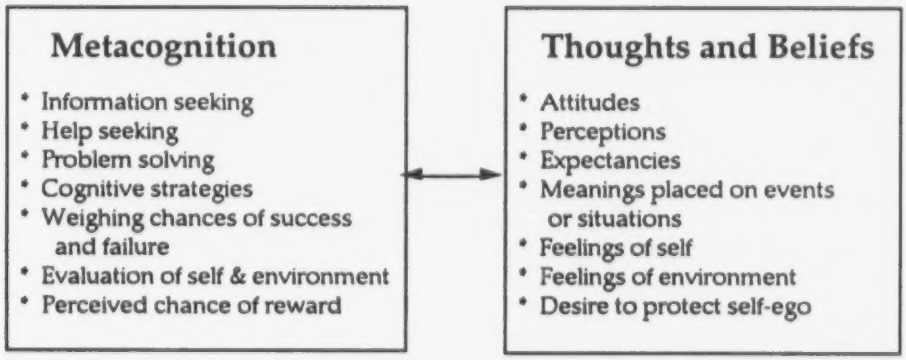
Cognition Influences

Cognition in the CMM (see Figure 6) consists of an array of factors related to attitudes, perceptions, and meanings generated by individuals (Ames, 1984; Ames & Ames, 1984; Boardman, Davis, & Lloyd, 1974; Covington, 1985; Heider, 1958; Maehr, 1974a, 1974b, 1974c, 1976, 1984; Marjoribanks, 1983; Raynor, 1969, 1970; Resnick,

1974) and those individuals' perceptions of their chances for reward (Bandura, 1977; Rotter, 1954). The cognition factor's components interact with ecological foundations, beliefs, and emotional states to comprise the volitional process.

Although Ames and Ames (1984) combined metacognition and cognitive strategies, the CMM model divides cognition into "metacognition" and "thoughts and beliefs." The reason for this subdivision of cognition is to display the interaction between process and formation of attitudes, perceptions, expectancies, and so on, as interactive, yet separate aspects of cognition. Metacognition consists of information and help-seeking, problem solving, strategy formation, and individuals' analyses of their chances of success and/or failure within their environments.

Figure 6
Cognition Factors



Thoughts and Beliefs

Maehr (1984) suggested that what individuals believe about themselves is important, and Dweck (1986) noted that these beliefs affect the abilities of individuals to influence/control their environments. In addition, others have stated that competence (Ames & Ames, 1984; Deci & Ryan, 1985; Maehr, 1976; Miller, 1982; White, 1959, 1960, 1963) and self-determination (Ames & Ames, 1984; deCharms, 1968; Deci, 1980; Schorr & Rodin, 1984) are important aspects of motivation processes. CMM assumes that self-competency and self-determinism are necessary components of motivation processes.

Influences Related to Beliefs

Competencies

The self-competency component of cognitive beliefs includes the following:

1. Development of (1) self-evaluational skills (Ames & Ames, 1984), (2) feelings of satisfaction, (3) self-worth, and (4) decision-making skills,

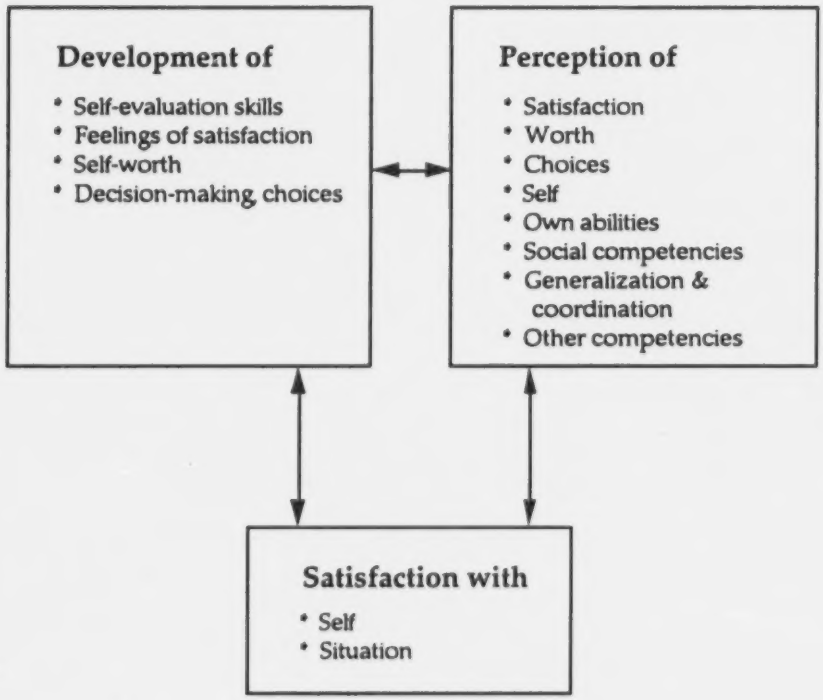
2. which results in perceptions of (1) satisfaction, (2) worth, (3) choices made, (4) self, (5) own abilities (Ames & Ames, 1984), (6) social competencies, (7) generalizations and coordination, and (8) other competencies; and

3. overall satisfaction with self and the situation (see Figure 7).

These factors have a strong impact on how satisfied individuals are with situations. Individuals' perceptions of required competencies and the actual competencies possessed are not necessarily the same.

It is very important that individuals protect their sense of self-worth (Covington, 1985; Nichols, 1975). In order to do this, individuals sometimes blame poor performance on other factors, procrastinate to avoid being blamed for failure, underachieve in order to avoid the shame of failure, attempt unattainable goals, choose highly difficult tasks, or choose very easy tasks (Atkinson & Raynor, 1974).

Figure 7
Influences on Development of Self-Competencies

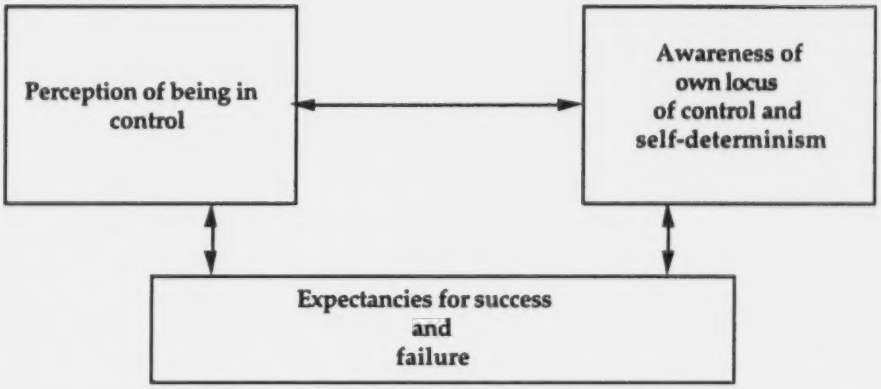


Self-Determinism

The second crucial belief, that of self-determinism (see Figure 8), encompasses awareness of the locus of control and feelings of being in control (Seligman, 1975; White, 1959). This belief also includes the effects of expectations regarding the success and failure of subsequent actions.

This dimension of CMM describes an individual's ability to control situations. Preconceived notions tend to influence an individual's expectations about the probabilities of success and failure for his or her future actions because causes of behavior are consciously being labeled (Phares, 1978; Rotter, 1966; Weiner, 1979). As a result, individuals often attribute their failures to such factors as lack of effort. They may also attribute their failures to bad luck which would signify that such individuals do not perceive themselves as being able to control their environments.

Figure 8
Self-Determinism's Components


Perception of being in control
Awareness of own locus of control and self-determinism
Expectancies for success and failure

Together, beliefs focused on self-competence and self-determinism tend to influence attitudes and serve as focal points for behaviors. Without the influences represented by these two belief-related subcomponents, individuals would be unable to reach conclusions, since only the processing of information would be possible. The cognitive component is very important to the development of motivation in individuals and suggests potential mechanisms for enhancing student motivation in instructional settings. The following discussion focuses on factors related to enhancement of cognitive-related motivation.

Hoyenga and Hoyenga (1984) suggested that individuals are motivated by three goals: (1) attaining an arousal level that optimizes task performance, (2) reducing tension or arousal created when everyday living routines are disrupted or threatened (which threaten task performance), and (3) receiving incentives from a variety of stimulations. Others (Dweck & Elliott, 1983; Nichols, 1984; Nichols & Dweck, 1979) referred to learning and performance goals as motivators of behavior. More recently, Dweck (1986) stressed that goals not only shape reactions to success and failure, but also influence the quality of cognitive performance.

Deci and Ryan (1985) looked at how self-competence and self-determination develop and sought to determine why external incentives tend to reduce such feelings in individuals. Finally, perceptions of reward structures (Ames, 1984; Covington, 1985) and their reinforcement value (Rotter, 1954, 1966) were shown to be important factors influencing interest, enjoyment, and involvement with environments. More specifically, some individuals may be extrinsically motivated to perform by money or grades, while others may be intrinsically motivated by their needs for accomplishment or challenge. Thus, some individuals may be extrinsically motivated to perform an action when influenced by external factors and others may feel intrinsically motivated to perform the same action because something inside them determines their desires to perform activities for inner pleasure—not because of outside influences.

Influence of the Emotional State

The emotional states of individuals figure prominently in volitional influences. Izard (1977) suggested that the emotions of interest, excitement, and joy are basic to motivation because they affect attitudes, perceptions, and expectations (elements of both the metacognitive and belief components). Anxiety has been described as an unpleasant and painful state (Fenichel, 1945) which easily disrupts motivation. Although tension and stress are positively related to peak accomplishment, too much stress (or boredom) can increase the likelihood of lethargy, while a sense of futility can result from too little stress (Selye, 1956).

Individuals' personality characteristics are also important determiners of action, and if levels of these characteristics are too high, they can inhibit student participation in educational programs (Maurice, Toroner, & Nill, 1984). Seligman (1975) suggested that learned helplessness and apathetic behavior can occur if individuals sense a of loss of control over situations in their environments, often resulting in emotional responses of anxiety, depression, motivation decrements, and lower levels of cognitive and physical performance. Thus, inability to control environments tends to threaten individuals' senses of security and their abilities to effectively meet the challenges of their lives, making it necessary for them to seek ways to feel secure again (Maslow, 1943, 1955).

MOTIVATION

The development of intentionality and free will is demonstrated by (1) choice, desire, or decision to participate (Ames & Ames, 1984; Dweck, 1975; Johnson & Johnson, 1985); (2) determination of the amount of effort or personal investment that is to be exerted (Ames & Ames, 1984; Boardman et al., 1974); (3) curiosity, persistence, and decision to accept responsibility; (4) level of certainty; (5) decision to focus on certain activities; (6) strategies to be used in face of failure; and (7) decision to control environments (Amabile, 1983). These behaviors are measurable in terms of the amount of effort exerted (Ames & Ames, 1984; Boardman et al., 1974), persistence (Dweck, 1975), knowledge gained, and/or achievement of particular skills (Ames & Ames, 1984; Boardman et al., 1974). Consequently, characteristics of these demonstrations of intentionality (shaped by volition) are identifiable and potentially malleable.

Intrinsic/Extrinsic Motivation

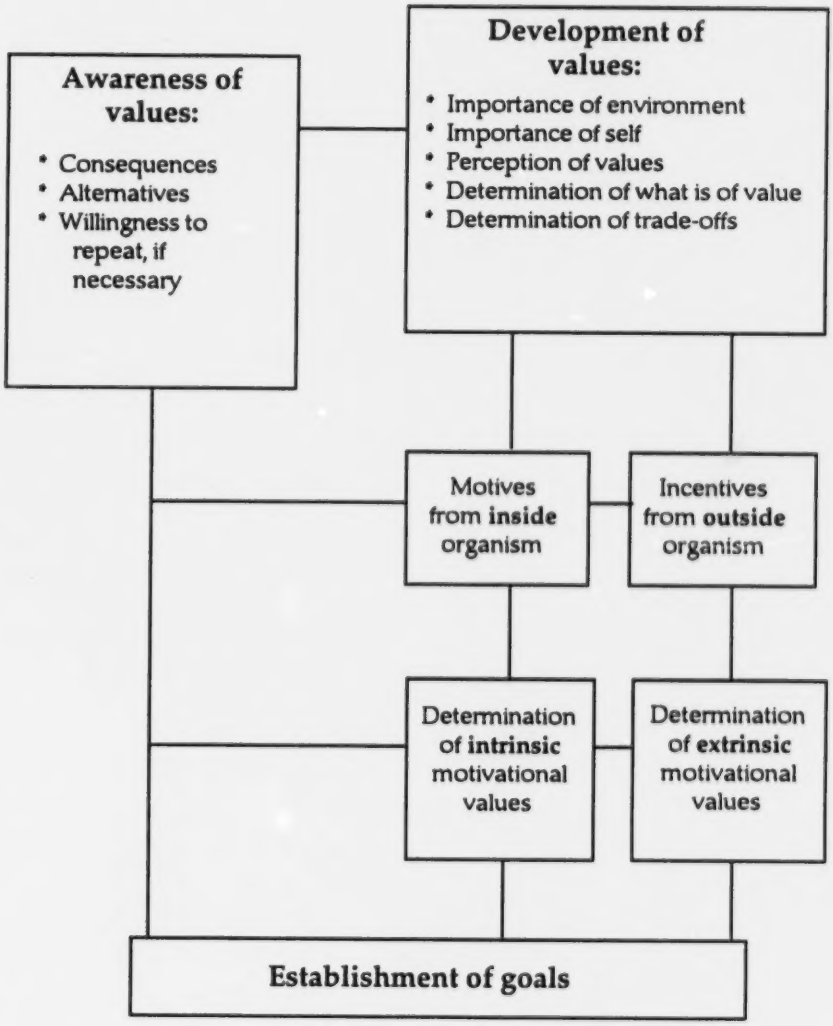
A crucial aspect of CMM is the differentiation of its intrinsic and extrinsic motives (see Figure 9). Many researchers have extensively examined these two forms of motivation. Each has been found to have a distinctively different effect on educational and learning processes. Typically, it is easy to observe the effects of extrinsic motivation on educational activities in daily interactions between parents and children or between teachers and their students. Students working diligently for high grades in school or children striving to earn their weekly allowances are typical examples of extrinsically motivated behaviors. The observation of intrinsically motivated behaviors tends to be more difficult.

In fact, Deci and Ryan (1981) argued the following:

> To be truly intrinsically motivated, a person must also feel free from pressures, such as rewards or contingencies. Thus, we suggest, intrinsic motivation will be operative when action is experienced as autonomous, and it is unlikely to function under conditions where controls or reinforcements are the experienced cause of action. (p. 29)

deCharms (1968)—also cited by Deci and Ryan (1981)—commented on the nature of intrinsically motivated behavior:

Figure 9
CMM's Motivation Component


Awareness of values:
• Consequences
• Alternatives
• Willingness to repeat, if necessary
Development of values:
• Importance of environment
• Importance of self
• Perception of values
• Determination of what is of value
• Determination of trade-offs
Motives from inside organism
Incentives from outside organism
Determination of intrinsic motivational values
Determination of extrinsic motivational values
Establishment of goals

> Man's primary motivational propensity is to be effective in producing changes in his environment. Man strives to be a causal agent, to be the primary locus of causation for, or the origin of, his behavior; he strives for personal causation. (p. 269)

Deci and Ryan (1981) asserted that people do not always want control of outcomes; indeed, they often prefer to have others take control. Thus, Deci and Ryan defined intrinsic motivation and proposed that

> The intrinsic needs for competence and self-determination motivate an ongoing process of seeking and attempting to conquer optimal challenges. When people are free from the intrusion of drives and emotions, they seek situations that interest them and require the use of their creativity and resourcefulness. They seek challenges that are suited to their competencies, that are neither too easy nor too difficult. (p. 32)

When discussing intrinsic and extrinsic motivation, Deci and Ryan (1981) contended that social pressures on individuals tend to regulate and control behaviors; thus, these pressures tend to function as external influences which instill values not previously held. Indeed, with extrinsic reinforcement these behaviors often become internalized or "owned" by individuals and knowledge of these outcomes affects their future actions. As individuals become more aware of values related to issues such as the environment or self, intrinsic and extrinsic motivation values evolve. Thus, biases are developed toward future events, and information obtained during these events subsequently influences other aspects of CMM. Further elaboration of extrinsic motivation and its properties are described in later sections of this document.

ASSESSMENT OF STUDENT TRAITS

Individuals approach future actions with personal biases and these biases enter a formative feedback loop which influences other components of the model. Subsequent actions by individuals can be influenced (see Figure 10) and possibly predicted, by the consequences of both success and failure (Maurice et al., 1984) and the probability of success and failure (Atkinson & Birch, 1970; Atkinson & Raynor, 1974). Expressions of individuals' aspiration levels, advice given to others, expressed desires to complete training, and expectations about the future all provide behavioral cues of those biases.

Figure 10
Potential Assessment Applications of the Model

Model Components:	Volition Processing	Motivation	Action	Consequences of Action	Subsequent Action
1. When questioned	• Before program • At entry • During program	• Before program • At entry • During program	• Before program • During program	• During program	• Before program • During program • After program
2. Question topics	• Formation of opinions, beliefs, & thoughts • Environment & individual factors •Self-determinism • Motivation	• Determination of value of finishing •Awareness of consequences of dropping & other alternatives	• Effort exerted in program • Effort exerted in other activities	• Biases toward program & events • Perceived consequences of behavior	• Biases toward future events • Advice to others • Perceived success in future events
3. Who questioned	• Student	• Student • Instructor	• Student • Instructor	• Student • Instructor	• Student

Because of this, vocational education students' biases about themselves and their training programs will influence their performance levels. Also, these prejudices will continue to evolve and can have both positive and negative tendencies. It seems critical that vocational educators assess these biases and seek to modify prejudices in ways that can maximize educational attainment and minimize the likelihood that some learners will become underachievers and/or dropouts. Such outcomes represent potential benefits of motivation-related assessment strategies based on CMM.

As suggested earlier, each component of the motivation schema could potentially be assessed. Assessment strategies could focus on volition—that is, readiness to perform as expected by authority figures and skill competencies of individuals. Motivations and intentions could be assessed in regard to (1) the perceived value of successfully completing training, (2) perceptions of the consequences of dropping out, and (3) the nature and extent of efforts to be exerted to attain successful program completion. Actions could then be assessed in respect to how much effort is exerted to be successful academically as well as in extracurricular and/or career planning activities. Based upon CMM's "consequence of action" component, individuals could be assessed regarding their biases and beliefs about the consequences of behaviors. Soon after students enter vocational programs, their biases and their perceptions about their chances of success could be assessed and information about these preconceptions could be used to predict students' actions in terms of their subsequent motivation to succeed in their training programs.

IMPLICATIONS FOR ENHANCING STUDENTS' MOTIVATIONS TO ACHIEVE

Keller et al. (1978) analyzed motives and proposed strategies to modify those motives. Approaching achievement motivation as behaviorists, they suggested that achievement-type behaviors should be identified and systematically reinforced. On the other hand, cognitive approaches would clarify and label clusters of achievement thoughts by teaching elements of achievement planning (Alschuler, 1973; based on McClelland & Winter, 1969). This would include teaching appropriate expressive styles such as (1) moderate risk-taking, (2) appropriate levels of initiative, (3) use of concrete feedback, (4) use of plans to prepare for the future, and (5) identification of the relationship between thoughts and actions to the context of life circumstances. Curricula could present

experiences that will facilitate the training of these behaviors as listed above. Educators should provide exercises and reinforcement with the goal of enhancing students' need for achievement. Keller et al. (1978) suggested a four-step process: (1) setting realistic goals, (2) evaluating and using feedback, (3) teaching personal responsibility, and (4) adequately assessing environments. Keller et al. also suggested that internal locus of control be fostered in order to encourage students to think in terms of themselves as "origins" of thought and action, rather than as being "pawns." This, in turn, could encourage students to set more realistic goals (deCharms, 1968). Essential to this approach is the provision of experiences that will decrease levels of "learned helplessness" (Dweck, 1975).

For example, Keller et al. (1978) found that curiosity and arousal-seeking can be increased by the use of Berlyne's (1965) theoretical notions about arousal. These notions are based on the premise that instructional activities should incorporate novelty, surprise, complexity, ambiguity, and uncertainty. Instruction should lead students to information that can relieve curiosity. Very curious students seek additional information and should be challenged by activities, examples, and analogies related to their specific training programs.

A variety of strategies could be implemented in training programs to accommodate students who need extensive stimulation. Use of multiple activities, fast-paced media, and the creative use of simulations or games are examples. Ideally, students should leave instructional settings still stimulated by their learning experiences. If these learning experiences are positive, students will continue their explorations after leaving school (Keller et al., 1978). Other suggestions cited by Keller et al. included lowering anxiety levels, encouraging and facilitating use of compensatory strategies such as mnemonics and other memory aids, and reducing the threats in learning environments.

Keller et al. (1978) assured educators that academic motivation can be increased. They proposed that students should be assessed to determine (1) their likelihood of working hard in school, (2) what counseling resources they may need, and (3) what educational environments and methods match their motivation traits. These assessment strategies could enable educators to identify at-risk learners before or during the early stages of training programs, enabling support service personnel to target at-risk students who are likely, otherwise, to become underachievers or dropouts. The proposed motivation model could direct efforts to develop effective tools and strategies for increasing the success of at-risk students in postsecondary vocational training programs.

APPLYING CMM CONCEPTS IN POSTSECONDARY VOCATIONAL PROGRAMS

Key issues identified by the literature review and the subsequent development of the Comprehensive Motivation Model (CMM) support the belief that it is feasible to develop a comprehensive array of motivation-related strategies for identifying and accommodating at-risk learners in postsecondary vocational training programs. Given the assumption that at-risk learners' performances in these programs are often marginal or substantially below their maximum ability levels, these strategies could be very helpful to large numbers of students. Such strategies and concepts should also be disseminated to support services providers, instructors, and students to minimize losses and to maximize gains. The resulting outcomes should enhance achievement motivation in students and, subsequently, increase the probability that they will successfully attain their training goals.

Persons developing and implementing these efforts should closely analyze the literature upon which this model is based in order to understand key issues and the complex interrelationships depicted in CMM. For example, the following issues are directly related to key concepts cited earlier and should be given careful consideration as potential topics for future research and development efforts: (1) How can at-risk students' sense of competence and persistence be used to enhance their sense of control over their educational endeavors? (2) How can vocational educators enhance the tendency of at-risk students to be energized by their needs to be competent and self-determined within their training programs? (3) How can vocational educators avoid or minimize at-risk students' tendencies to increase their problem-causing traits (i.e., diminished motivation to succeed) when they encounter educational challenges? (4) How can at-risk students' abilities to perform cognitive tasks be enhanced by combining those tasks with activities related to motivational processes? (5) How can the accomplishments of at-risk students be enhanced by manipulating the positive and negative influences within their learning environments? and (6) How can at-risk learners' motivational traits be enhanced by manipulating environmental influences by focusing on volitional processes, intrinsic motivation, metacognitive strategies, self-esteem levels, social competencies, perceived locus of control, coping repertoires, and beliefs about the probability of success or failure.

CONCLUSIONS

Clearly, prior research findings support the belief that there is a substantial need to develop motivation-related strategies to support at-risk learners in postsecondary vocational programs. After being developed and validated, such strategies should be used to assist these students before they enter training programs, at the time of entry into training programs, and while participating in programs. Information collected about motivation traits should focus on (1) background factors, (2) opinions, (3) competencies, (4) self-determinism, (5) determinants for action types and amounts of effort exerted, (6) biases, (7) perceptions, (8) advice given to other students, and (9) expectations and perceptions of success and failure in past and future events. In addition, future researchers should examine the effectiveness of risk reduction strategies based upon CMM's concepts in order to help accommodate at-risk learners before they greatly lower their performances within their training programs and/or before they drop out of their postsecondary vocational programs.

The potential uses of CMM are numerous and widely varied. For example, individuals could systematically be evaluated before beginning their training programs, as well as during their programs, to detect a larger percentage of students who are (or who are becoming) at-risk. This approach acknowledges the belief that motivation is not a concrete, stable attribute, but it is a condition that is changing as a result of environmental and personal conditions which are continuing to evolve (thus, they should be assessed and treated periodically). Fortunately, prior researchers have also reported that motivation to achieve educationally can be enhanced. Therefore, CMM has substantial utility if it can function as a source of guidance for developing strategies to increase students' successes and to encourage students' adoption of lifelong self-empowerment strategies. CMM was developed to be a new tool for vocational educators who wish to develop programs and support strategies focused on the motivation traits of students. This represents an important area that vocational educators have yet to examine closely.

RECOMMENDATIONS

Based on the ideas and conclusions presented in this publication, it is recommended that researchers seeking to supplement the efforts of this project focus their research on (1) expanding and refining CMM's concepts, (2) developing risk-reducing strategies related to the model's concepts, and (3) validating those strategies' effectiveness and efficiency. Examples of the questions that should be addressed by this research include the following:

1. *When* should motivation-enhancing strategies be provided in postsecondary vocational education programs?

   For example, Can pre-enrollment measures of persistence provide accurate indications of subsequent motivation related to training programs? Are assessments of student motivation two to three weeks after entering instructional programs sufficient to predict long-term successes in those programs? When should information about individuals' motivational traits be used to guide vocational educators' efforts to overcome risks associated with at-risk students' motivation traits? When should metacognition-enhancing strategies be used to aid vocational educators' efforts to accommodate their at-risk students' motivational deficits?

2. *Who* should develop and implement strategies to address risks related to motivation issues?

   For example, are counselors the most appropriate personnel to conduct pre-instructional student assessment efforts? After students progress farther into their training programs, should instructors or specific support services personnel (e.g., technical tutors, special needs supervisors, counselors, remedial specialists) monitor and accommodate motivation-related behaviors to maximize progress toward the development of skills needed to succeed in training programs?

3. *How* should these strategies be conducted?

   It is not yet known which approaches are most effective for addressing at-risk learners' motivation traits. However, some of the assessment strategies that may be suitable are paper and pencil instruments, observations, discussions with persons who know an individual personally, and structured interviews. Assessments could also collect information from sources such as student records, performance tests, or various personality inventories. These assessments could be entirely performance-based or some combination of the above. Key issues influencing the selection of

other accommodation strategies include (1) availability of staff, (2) additional training required by staff, (3) proven validity and reliability of procedures and materials, (4) acceptability to persons being assisted, (5) availability of sufficient resources and commitments, and (6) a wide variety of other policy and context-related issues. Efforts to develop these strategies are likely to require research using techniques such as surveys, focus groups, case studies, and/or experimental studies.

These questions and many others should be considered by persons seeking to successfully develop and implement motivation-related accommodation strategies for at-risk learners in postsecondary vocational education programs.

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